

TO: AAT Members and Participants

FROM: Laura Brandt, Susan Gray, and Elmar Kurzbach, tri-chairs, AAT

DATE: July 2, 2001

SUBJECT: Adaptive Assessment Team Meeting Minutes – May 22 2001,
Secret Woods Park

The following people attended the Monitoring Design Development – EMAP Presentation EPA:

Daniel Apt	FDEP	Nick Aumen	NPS
Tomma Barnes	SFWMD	Ronnie Best	USGS
Laura Brandt	USFWS	Steve Davis	SFWMD
Tom Fontaine	SFWMD	Susan Gray	SFWMD
Betty Grizzle	USFWS	Aaron Higer	
Elmar Kurbach	Corps	Linda Lindstrom	SFWMD
Brenda Mills	SFWMD	Tony Olsen	USEPA
Peter Ortner	NOAA	Mary Ann Poole	USFWS
David Rudnick	SFWMD	Fred Sklar	SFWMD
Jerry Stober	USEPA	Doug Strom	FDEP
Kent Thornton	FTN Assoc		

1. Introduction of attendees. Introduction of the CERP Monitoring Assessment Plan. Brief discussion on how the plan was developed and how we expanded participation.

2. Kent Thornton provided an overview of Monitoring Design, and presented EMAP concepts - the merger and integration of probabilistic versus fixed station sampling. Addresses a variety of questions and function at a variety of scales. Needs to mirror the management and policy designs. Providing the science to make those decisions, (Bardwell, 1991).

3. Five fundamental questions:

- 1) How big is the problem?
- 2) Is it getting better or worse?
- 3) What's causing it?
- 4) What can be done about it?
- 5) Is management making a difference?

4. Large scale questions are Status, Trends, Associations, Regulatory, Management

"EMAP is not designed to address site specific questions"

5. Next we need to develop a question hierarchy, management decision making requires estimates of magnitude, extent, trends, cause and association, and effectiveness.

6. Focus on flexible, adaptable monitoring designs, using three different approaches, which include census, preferential sites, or probability sites. Statistical designs are typically used for experiments, but can also be applied to sample surveys.

7. Steps for monitoring design:

- 1) formulation of questions and objectives
- 2) Determine process for site selections.
- 3) determine process to take the measurements.
- 4) Establish procedures for indicators calculating.
- 5) Project from sample to resource
- 6) Communicate the results
- 7) Reiterate design elements - statistical and response

Need to justify why specific data being collected - link the questions defined by the conceptual models back to the CERP program and individual projects. Make sure data collected specifically addressing types of statistical designs.

1. Probability/Response Survey Design (Tony Olsen)

Items to consider in response design include the index period, status, change and trend, associations and risks. Be clear on objectives, don't allow it to become obsolete scientifically (update technology and plan for it, integrate calibrations. Don't let it disconnect from decision-making.

Question on how to communicate status, change and trends. Need to be able to compare the difference and explain statistical relationships and actual causal relationships, associations and risks and how to blend statistical sampling with cause and effect research (may not be able to approach it through the need to validate numeric models). You then use these results to verify costs, postulations and predictions.

Also, need to identify key populations/sub populations and have objectives for each, identify by priority, with precise statements and identification of elements.

For a large scale, multi-year design, can approach this through a rotating basin design over a set period of years. The caveat is that you can't answer questions until all basins sampled.

Another approach is a state-wide sampling scheme.

9. Review of case studies: Focus on questions rather than hypothesis, avoid single-issue management.

10. SF mercury study: EMAP \$ 750,000 per year
Sampling over three years costs \$ 2,000,000.

11. CERP Monitoring objectives – What to accomplish, which design best suits?

Avoid “SWAT Team Ecology” – Running out to monitor specific attributes to answer issues.

For CERP monitoring & Assessment Plan development, must frame conceptual models, hypotheses, etc., then review and apply varying monitoring design components, QA/QC, links to management decisions. Must answer questions on extent, magnitude, processes, causes, trends, etc. A multiple process to assess where we are going, how we look at other processes to backstop cause-effect, and to be sure we have no unanticipated consequences. Identify broad questions, step down to details (integrated, complicated system where lots of things interact), then step back up for conclusions. Be sure that what you measure shows how they interact, especially trophic level interactions and changes to the south.

Concern was raised that there are currently over 150 indicators developed, and that if these are all measured we likely couldn't interpret the volume of information generated. So, must recognize key hypotheses of CERP (objectives), suites of parameters linked to ongoing research, monitoring a suite of relationships and the research to answer specific questions.

EPA observed that when conceptual models are put together, that's where you must define key watersheds, species and habitats, look at that, develop expectations of how, when, select indicators to get you to those key focal points.

Design (adapt to) methods, standardization, QA/QC, data handling, analysis and reporting, and field efforts easily account for 40% of monitoring costs, and these are often overlooked. Over the life span, (30+ years), as things come on line they change the system, be sure to consider to those specific points. This is reality of system; it changes in between, despite everything.

So - Action Items? Where do we go?

Two subgroups – Priorities and what focus, as well as approach.
Take the agency comments, incorporate, revise and generate a revised draft.
Bring EMAP folks back for continued discussion

Open discussion, Q&A

- How do we deal with changing spatial boundaries and ecotones? Tough thing to address, use remote sensing to assess condition and aerial extent over time, see if it increases or decreases (i.e.: tree islands)
- How long from when mercury was identified as an issue until EPA sampling began? Issue was raised in '92, sampling started in '93, so about a year. (EPA says it is not realistic to do it in less time, especially with the magnitude of the program.)
- How would EPA deal with surprises not currently covered? It is impossible to have all the answers. If the monitoring program is any good, it's impossible to answer all the issues discovered. When attempted, must develop a process study to understand why, then move on - an evolution of science and research questions. Traditionally, do the specifics, identify issues, and then go to more general conclusions. (Hang off of the general conclusions to get to specifics) Secondary analysis of survey data can answer new research questions - need regional scale data (social scale it works). On environmental scale - not there yet. Ecologists need to be taught that monitoring is science (not just research).
- In adaptive management, research alone is not predictive. Monitoring is needed to identify trends.
- Expect the unexpected - good scientists will not find much unexpected. (Swag instead of sWag).
- Monetary commitment will drive how much is left to the unexpected.
- Every 10-15 years, make some significant change of indicators or survey design based on what we are learning - keep track of impact to overall trends versus from the changes specifically (?)
- EMAP has been used in Nanticoke, VA, wetlands restoration of Chesapeake Bay SAV since '94
- Historically monitoring has been issue or site-specific - These days research programs to improve monitoring and assessment in aquatic areas and resources. Research on designs or statistical basis with regional scale studies. Work to involve the state to take a look at what's going on - to do probability surveys, some "point" problems still need to be addressed, and the "State" must be able to do that.
- Ability to make national statements about the state of the environment is still lacking - EPA is working on this. Political reality is that a National Program can't get off the ground without being tied to the states, and they must fight hard to keep consistency across the states.

- EPA will participate in the design of our MAP (for little to no charge) to get the consistency founded. Their experience is you can recover from a bad analysis design, but not from a bad survey design. So - pay attention up front, focus the effort on refining statistical analysis efforts to get consistency.

A task for the AAT members - Identify what kind of help we think we need. Submit ideas or comments to Susan Gray, Laura Brandt or Elmar Kurzbach.

